Fermilab

PPD/MD/Engineering Analysis Group

A Buckling Calculation for a 32-planes Block (Cell Size of 6.0cm x 3.8 cm)

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A 3-D finite element model is used to calculate the buckling SF for a 32 -planes block under a distributed G load (filled). The model uses a slice of the structure with a symmetry condition imposed at front and back of the cell shown in Fig 1. A shell element is used. The calculation result is summarized in Table 1.

Table 1 Results of the buckling calculation for a 32-planes block (for a distributed load _G Load)

Number of planes	Buckling Safety Factor (SF)	
	Low end fixed; top free	Low end fixed; top guided
32	2.28	2.94

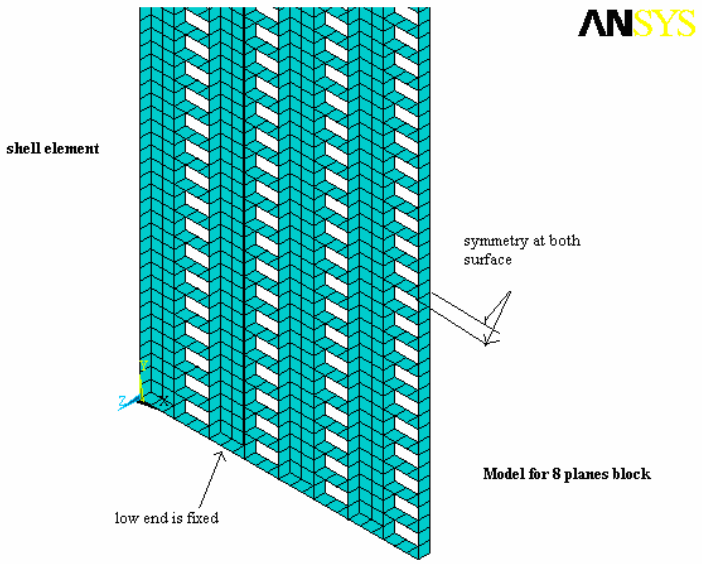

Figure 1 FEA model for a 8 planes block

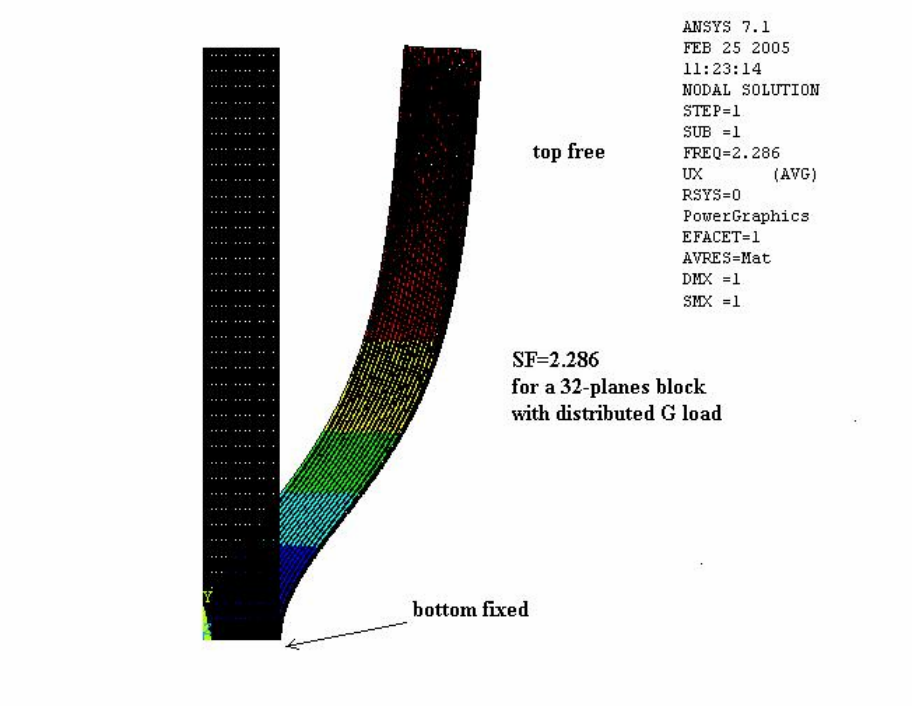

Figure 2 32-planes buckling calculation for a distributed G load (top free)

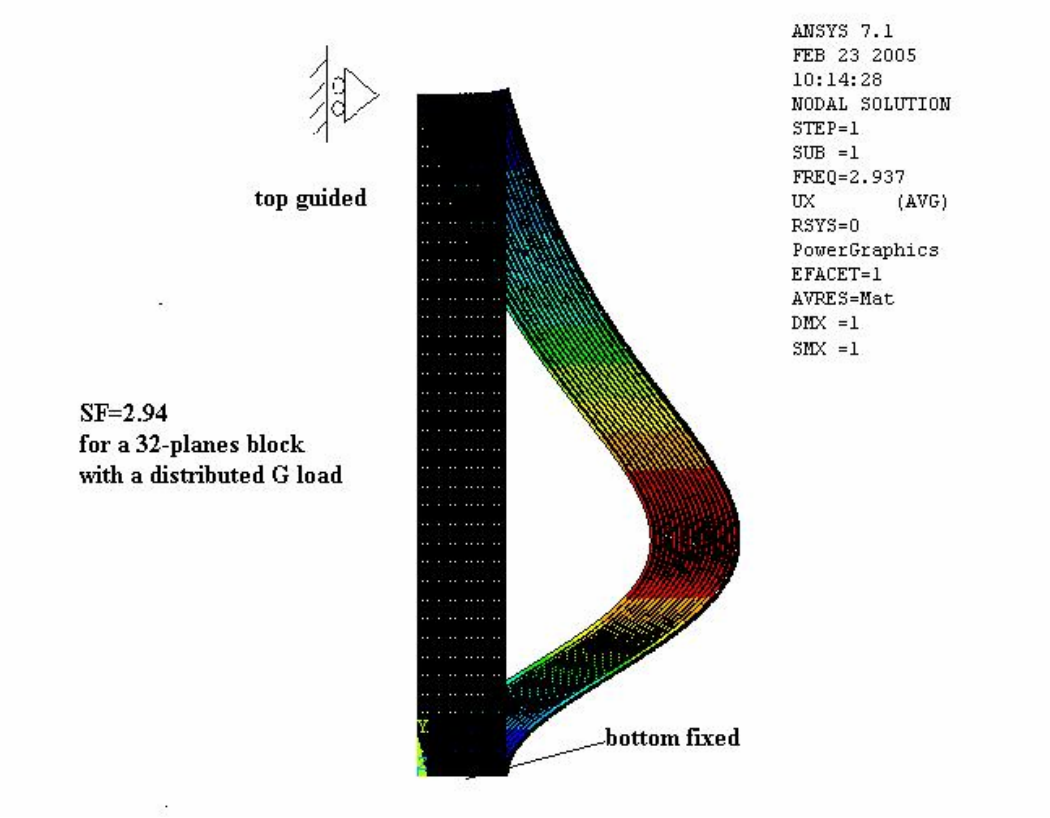

Figure 3 32-planes buckling calculation for a distributed G load (top guided)